

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

As a preliminary matter, the Office Action indicates that reference JP-2001-236971, listed on page 1 of the specification is not a proper Information Disclosure Statement (IDS) because it does not appear on a separately filed IDS. Applicants respectfully submit that reference JP-2001-236971 was submitted on the IDS filed on July 27, 2006 and was considered by the Examiner on November 7, 2007. A copy of the initialed and signed Form PTO/SB/08 listing this reference was returned to Applicants with the Office Action dated November 21, 2007. Confirmation of this point in the next communication is respectfully requested.

Claims 8, 9 and 12-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0051902 to Suenaga et al. (hereinafter "Suenaga"). Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Suenaga in view of U.S. Patent Application Publication No. 2003/0224233 to Kohler et al. (hereinafter "Kohler"). Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Suenaga and Kohler in further view of U.S. Patent Application Publication No. 2003/0041444 to Debe et al. (hereinafter "Debe").

By this amendment, claim 9 has been canceled without prejudice to or disclaimer of the subject matter contained therein. Claim 8 has been amended to incorporate the subject matter of canceled claim 9. Claims 10-14 remain unchanged in the application.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. After amending the claims as set forth above, claims 8 and 10-14 are now pending in this application for consideration.

Applicants respectfully submit that sole independent claim 8 and claims dependent therefrom, are patentably distinguishable over the cited references as required by § 103. Applicants further submit that none of the cited references, whether considered alone or in combination, discloses, teaches or suggests Applicants' claimed manufacturing method for a polymer electrolyte fuel cell including several preprocessing steps as discussed below which leads to *obtaining an integrated fuel cell through a single process of applying heat and pressure to the first separator and the second separator using the pressing jigs* as required by amended independent claim 8. By contrast, the cited references fail to disclose, teach or suggest these claimed steps and arrangements. Accordingly, independent claim 8 and claims dependent therefrom are patentably distinguishable over the cited references. This distinction will be further described below.

THE CLAIMS DISTINGUISH OVER THE CITED REFERENCE

Claims 8, 9 and 12-14 stand rejected as being unpatentable over Suenaga. Also claim 10 stands rejected as being unpatentable over Suenaga and Kohler and claim 11 stands rejected as being unpatentable over Suenaga, Kohler and Debe. In response, Applicants traverse the rejections and respectfully submit that the claims are allowable at least for the reasons that follow.

The framework for the objective analysis for determining obviousness under §103 requires:

1. Determining the scope and content of the prior art;
2. Ascertaining the differences between the claimed invention and the prior art;
3. Resolving the level of ordinary skill in the pertinent art; and
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Teleflex, Inc. v. KSR Int'l Co., 127 S. Ct. 1727, 82 USPQ2d 1385 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). In order to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). See MPEP §2143.03.

The Cited References Do Not Suggest All Claim Recitations

The cited references do not meet one of the requirements of MPEP § 2143, which is that “the prior art reference (or references when combined) must teach or suggest all the claim limitations.”

Embodiments of the present invention relate to a manufacturing method for a polymer electrolyte fuel cell. The manufacturing method according to independent claim 8 includes the steps of applying an adhesive to a surface of the first separator which contacts the first gas diffusion layer and applying the adhesive to a surface of the second separator which contacts the second gas diffusion layer.

According to one embodiment of the present invention as now required by amended independent claim 8, the method further includes the following steps of: (1) *applying an adhesive to a partition wall portion defining a gas passage on a surface of the first separator which contacts the first gas diffusion layer*; (2) *applying the adhesive to a partition wall portion defining a gas passage on a surface of the second separator which contacts the second diffusion layer*; and (3) *disposing the first separator, the first gas diffusion layer, the polymer electrolyte membrane, the second gas diffusion layer, and the second separator between a pair of pressing jigs so as to be laminated in the described sequence*. These preprocessing steps leads to *obtaining an integrated fuel cell through a single process of applying heat and pressure to the first separator and the second separator using the pressing jigs*. Performing these steps shortens the manufacturing process of the polymer electrolyte fuel cell (page 2, lines 6 and 7).

One exemplary embodiment of the present invention is illustrated in FIG. 4 of the present application, which shows the integration of all of the components of the fuel cell (i.e., the polymer electrolyte membrane (5), the gas diffusion layers (6A and 6B) and the separators (7A and 7B)) through a single process of applying heat and pressure to the first separator 7A and the second separator 7B using the pressing jigs (113 and 123) with the first and second separators 7A and 7B including partition wall portions 7F positioned between gas passages 7C of the first and second separators 7A and 7B (page 4, lines 1-12 and page 9, line 16

through page 10, line 13) Applicants respectfully submit that the cited references fail to disclose, teach or suggest these claimed steps and arrangements as well as the benefits provided.

Suenaga is concerned with problems created by mounting seals in a membrane electrode assembly (*Suenaga*, paragraph 11, lines 1-4). To address these problems, Suenaga discloses forming in advance, a seal into a predetermined shape, setting the seal at the mounting portion of the membrane electrode assembly and integrally forming the seal with the membrane electrode assembly (paragraph 12, lines 10-13). As clearly illustrated in FIG. 1E, Suenaga teaches that to coat an adhesive 50 on the close-contacting surface 15 of the seal 10A, in hot pressing, the close-contacting surface 15 is adhered to the electrolyte membrane 23 via the adhesive 50 and the seal 10A is integrally mounted to the membrane electrode assembly 20 (paragraph 37, lines 8-13). Thus, Suenaga only teaches the sealing of the electrolyte membrane 23, the electrode plates 21 and 22A and the seal 10A using an adhesive. Suenaga describes the following benefits of adhering membrane 23 to the seal 10A:

“According to the above embodiment, since the seal 10A has been preformed, the seal is integrally formed with the membrane electrode assembly 20, excess heat load is not exerted on the membrane electrode assembly 20 in comparison with the conventional method in which a seal is adhered to a membrane electrode assembly by vulcanization. Therefore, problems such as deterioration, contamination, and damage to the positive electrode plate 21, the negative electrode plate 22A, and the electrolyte membrane 23 can be avoided, and the seal 10A can be normally mounted on the membrane electrode assembly 20. Since the seal 10A is mounted on the membrane electrode assembly 20, operation for handling separated seals can be omitted when the membrane electrode assemblies 20 and seals are alternately layered to form a fuel cell stack, and the seal 10A does not easily become twisted and misaligned, whereby the sealing properties can be improved. Furthermore, since the assembly of the membrane electrode assembly 20 and the mounting the seal 10A to the membrane electrode assembly 20 can be performed at the same time as the hot pressing, the process can be simplified.” (paragraph 38, lines 1-21)

Although a separator plate is layered on both surfaces of the membrane electrode assembly 20 so as to form a gas passage, and a frame-shaped separator plate is held between the membrane electrode assembly and the separator plate so as to seal the gas passage air tight (paragraph 18, lines 1-9), there is absolutely no disclosure, teaching or suggestion in Suenaga of the separator plate or the frame shaped separator plate being adhered to the membrane electrode assembly. As a matter of fact, there is no disclosure, teaching or suggestion in Suenaga of applying an adhesive to any other layered structure in the fuel cell unit except for the electrolyte membrane 23 and the seal 10A.

Independent claim 8 now requires ***applying an adhesive to a partition wall portion defining a gas passage on a surface of the first separator which contacts the first gas diffusion layer*** and ***applying the adhesive to a partition wall portion defining a gas passage on a surface of the second separator which contacts the second diffusion layer***. The Office Action at page 4 asserts that the adhesive taught by Suenaga is not restricted to certain portions of the junction between the separator plate and the gas diffusion electrode plate and therefore would include application at the partition walls among other locations. Applicants respectfully disagree. Forming a gas passage makes the pressure applied to the first separator and the second separator concentrate on a portion other than the gas passage (i.e., the partition wall portion) which is preferable in enduring sufficient pressure to adhere the separators to the gas diffusion layers. Applying the adhesive to a partition wall portion defining a gas passage brings complete adhesion of the separators to the gas diffusion layers because when heat and pressure applied to the first and second separators using the pressing jigs, they are concentrated on the partition wall portion when the adhesive is applied. Thus, contrary to the Office Action's assertion, the adhesive taught by Suenaga is not applied to the partition walls.

As discussed above, Suenaga fails to disclose, teach or suggest applying an adhesive to any other layered structure in the fuel cell unit except for the electrolyte membrane and the seal. Therefore, Suenaga fails to disclose these claimed steps. Since Suenaga fails to disclose, teach or suggest the claimed steps of a partition wall portion defining a gas passage of the first and second separators, it goes without saying that Suenaga fails to disclose, teach or suggest the claimed step of ***disposing the first separator, the first gas diffusion layer, the***

polymer electrolyte membrane, the second gas diffusion layer, and the second separator between a pair of pressing jigs so as to be laminated in the described sequence.

Moreover, since Suenaga fails to disclose, teach or suggest the above-identified preprocessing steps, Suenaga also fails to disclose, teach or suggest the claimed step of ***obtaining an integrated fuel cell through a single process of applying heat and pressure to the first separator and the second separator using the pressing jigs.*** What Suenaga discloses is a two-step process for obtaining an integrated fuel cell. This is confirmed by the Examiner's remarks found on page 4 of the Office Action.

The Kohler and Debe references were relied upon to address various features and arrangements recited in some of the dependent claims. Applicants respectfully submit that the Kohler and Debe references, whether considered alone or in combination, fail to disclose, teach or suggest the claimed steps and arrangements indicated above and were not cited for that purpose.

In view of the fact that the cited references, whether considered alone or in combination, do not disclose the claimed steps and arrangements indicated above, these references cannot be said to render obvious the invention which is the subject matter of independent claim 8. Thus, independent claim 8 is allowable.

Since independent claim 8 is allowable, claims dependent therefrom, namely claims 10-14 are also allowable by virtue of their direct or indirect dependence from allowable independent claim 8 and for containing other patentable features. Further remarks regarding the asserted relationship between any of the claims and the cited reference are not necessary in view of their allowability. Applicants' silence as to the Office Action's comments is not indicative of being in acquiescence to the stated grounds of rejection.

In sum, one of the requirements of MPEP § 2143 is not satisfied in the Office Action with respect to any of the claims rejected as obvious because the cited references do not teach each and every element of the present invention. Thus, the present claims are allowable.

The Level of Ordinary Skill In the Art has Incorrectly Been Ascertained

KSR did not repeal the *Graham v. John Deere Co.* factors - just the opposite, it reaffirmed them. One of those factors is the requirement that the PTO must resolve the level of ordinary skill in the pertinent art. It is respectfully submitted that the PTO presumes a higher level of skill of the ordinary artisan in this art than was actually present at the time of the invention.

The ordinary artisan would not have had a level of skill sufficient to render the invention obvious to that ordinary artisan. Specifically, before the disclosure of the present invention, the ordinary artisan would not have had the skill to predict that the features of Suenaga could be modified as is asserted in the Office Action. To the contrary, only the innovator would have had the skill necessary to predict such modification. The ordinary artisan would not have had the skills to arrive at the present invention without instruction from the innovator. The Office Action is silent in regard to addressing the requisite *Graham* factors.

Lack of Sufficiently Articulated Rationale to Modify or Combine the References

The Office Action fails to meet the requirement of providing a sufficiently articulated rationale to modify Suenaga.

The Supreme Court in *KSR* stated that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the art...it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR* at 1741. In addition, the Court in *KSR* stated that a reason to combine

elements should be made explicit. *Id.* at 1740-41.¹ Indeed, the Court approvingly cited *In re Kahn*, 441 F.3d 977 (Fed. Cir. 2006), for requiring an articulated reason. *Id.* at 1741.²

Suenaga, when taken as a whole, teaches away from obtaining an integrated fuel cell through a single process of applying heat and pressure to the first separator and the second separator using the pressing jigs. Suenaga specifically teaches the use of a two-step process for obtaining an integrated fuel cell. It is well known to use a two-step process for obtaining an integrated fuel cell in order to check the seal of the electrolyte membrane assembly before assembling the remainder of the fuel cell unit. Thus, one of ordinary skill in the art seeking to examine the seal of the electrolyte membrane assembly before assembling the remainder of the fuel cell unit would apply a multi-step process.

In support of the obviousness rejection, the Office Action merely concludes that forming in one piece an article which was formerly formed in two pieces and put together involves only routine skill in the art. However, the Office Action is silent in regard to a specific reason why one of ordinary skill in the art would have been motivated in the first place to form a one piece unit. That is, the Office Action simply states an advantage of the one piece unit, but does not identify why one of ordinary skill in the art would have seen this as an advantage when checking the seal of the electrolyte membrane assembly is important.

The creation of a one piece unit, however, provides unexpected results. MPEP § 716.02(a), subsection 3, states that the “presence of an unexpected property is evidence of nonobviousness.” Applicants respectfully submit that an integrated fuel cell through a single process according to the present invention yields unexpected results. For example, the integrated fuel cell through a single process according to the present invention permits the manufacturing process for a polymer electrolyte fuel cell unit to be shortened which is

¹ “Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit.” *Id.* at 1740-41.

² “Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness” *Id.* at 1741.

advantageous for a fuel cell stack using a large number of fuel cells. This is a characteristic of the claimed invention that would be unexpected by the ordinary artisan as it is well known in the art to examine the seal of the electrolyte membrane assembly before assembling the remainder of the fuel cell.

Also, the integrated fuel cell through a single process according to the present invention provides unexpectedly high adhesion of the layers and stability. In sum, one of ordinary skill in the art, when furnished with the teachings of Suenaga, would not have expected these improved characteristics, and thus, Applicants respectfully submit that, assuming *arguendo* that a *prima facie* case of obviousness has been established, Applicants have rebutted the case of obviousness.

Applicants respectfully submit that independent claim 8 and claims dependent therefrom are patentably distinguishable over the cited references and thus, allowable. Further remarks regarding the asserted relationship between any of the claims and the cited references are not necessary in view of their allowability. Applicants' silence as to the Office Action's comments is not indicative of being in acquiescence to the stated grounds of rejection.

CONCLUSION

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the


Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 672-5490
Facsimile: (202) 672-5399

By Thomas S. Bilecki Reg. No. 43,438

 Michael D. Kaminski
Attorney for Applicant
Registration No. 32,904